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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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10/050,700

01/18/2002

Wei Ping Zheng

967AF

7390

7590

03/10/2003

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EXAMINER

BETTENDORF, JUSTIN P

ART UNIT

PAPER NUMBER

2817

DATE MAILED: 03/10/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

# Office Action Summary

Application No.

10/050,700

Applicant(s)

ZHENG ET AL.

Examiner

Justin P. Bettendorf

Art Unit

2817

-- Th MAILING DATE of this communication appears on th cov r sheet with the corr spondence address --

## Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

## Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is FINAL. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

## Disposition of Claims

- 4) ☒ Claim(s) 1-28 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-28 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

## Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 18 January 2002 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on \_\_\_\_ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

## Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.
- 14) ☒ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

## Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) \_\_\_\_.
- 4) ☐ Interview Summary (PTO-413) Paper No(s) \_\_\_\_.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: \_\_\_\_\_

## **DETAILED ACTION**

### ***Priority***

If applicant desires priority under 35 U.S.C. 119(e) based upon a previously filed provisional application, specific reference to the earlier filed application must be made in the instant application. This reference should appear as the first sentence of the specification following the title, preferably as a separate paragraph unless it appears in an application data sheet.

### ***Drawings***

1. The drawings are objected to under 37 CFR 1.83(a). The drawings must show every feature of the invention specified in the claims. Therefore, the cascaded power splitters as recited in claims 9-11 and 20-22 must be shown or the feature(s) canceled from the claim(s). No new matter should be entered.

A proposed drawing correction or corrected drawings are required in reply to the Office action to avoid abandonment of the application. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The specification is objected to as failing to provide proper antecedent basis for the claimed subject matter. See 37 CFR 1.75(d)(1) and MPEP § 608.01(o). Correction of the following is required: The subject matter of claims 9-11 and 20-22 (i.e. the cascaded power splitters).

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*Claim Rejections - 35 USC § 103*

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

5. Claims 1-28 are rejected under 35 U.S.C. 103(a) as being unpatentable over Tanigawa et al. JP 62-147808 in view of Branchevsky United States Patent No. 6,252,761 and Rosenberg United States Patent No. 4,516,092.

The Tanigawa et al. reference discloses in figure 1 a power splitter comprising: a resistor 5; a capacitor 4; a binocular-core transformer 11 (figure 3) with windings 1, 2, and 6 that provide power dividing and impedance matching (suggested by  $Z_i$ ,  $Z_o$ ,  $Z_o$  in figure 1). However, the reference does not show the claimed structure, which includes a substrate with vias having the capacitor in the layers and the resistor on the layer.

Nevertheless, The Branchevsky reference teaches that circuits are advantageously formed using LTCC (low-temperature co-fired ceramic) substrates with capacitors built in the substrate

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(with screened electrodes on different layers) using vias (punched and filled with a conductive material) for connections and circuits printed on the layers that are then stacked, pressed, and fired in an oven. LTCC allows for smaller sized circuits than using a standard circuit board. Bulky elements are located on the surface (see col. 1, lines 12-50).

The Rosenberg reference teaches in figure 2 that a bulky inductor device is mounted on the surface of a capacitor by adhesives (col. 2, lines 55-60) with the leads attached to the terminals on the upper surface (col. 2, lines 62-63).

Accordingly, it would have been obvious to one of ordinary skill in the art at the time of the invention to have formed the power splitter of Tanigawa et al. on a LTCC substrate with the capacitor built-in using vias to make connections and the bulky transformer <sup>on the surface</sup> as taught by both of the Branchevsky and Rosenberg references (with the method suggested by Branchevsky and Rosenberg) because such a modification would have advantageously formed a reduced-sized splitter as suggested by Branchevsky and Rosenberg.

With respect to impedance matching as recited in claim 1, such a modification would have been obvious even if the Tanigawa et al. reference does not explicitly state it because such impedance matching is required for proper operation (i.e. no reflections). Also, with respect to forming the resistor on the top layer (e.g. claim 12), such a modification would have been obvious because it would have advantageously allowed trimming of the resistor as would have been well known.

With respect to attaching the transformer using epoxy (e.g. claims 4, 16), such a modification would have been obvious because as the references are silent as to the type of adhesive used, any art-recognized equivalent adhesive would have been usable such as epoxy.

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With respect to using welds to attach the leads (e.g. claim 6, 17, 25), the Rosenberg reference suggests using solder or other means (col. 2, lines 62-63). Welds are well-known art-recognized equivalent means for making electrical connections and use thereof would have been considered a mere substitution of art-recognized equivalent electrical attachment means.

With respect to attaching the device to a circuit board by reflow solder, it should be noted that such practice is conventional for attaching circuits to a circuit board in mass production; therefore, such a modification would have been obvious because it would have allowed for connection to other devices on a circuit board in mass production.

With respect to cascaded power splitters (claims 9-11 and 20-22), such cascading is well known in order to form multiple outputs as is desired based on the required use. Therefore, such a modification would have been obvious.

### *Conclusion*

6. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

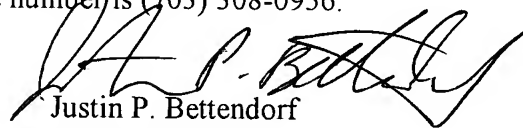
- a. Andresen United States Patent No. 5,097,234 discloses cascading splitters for form a multi-way power splitter (figure 4).
- b. Fleeger et al. United States Patent No. 5,705,962 teaches forming the resistor on the surface for trimming in a power splitter. The reference also suggests using LTCC (see col. 5, lines 8-11).
- c. Mandai et al. United States Patent No. 5,726,612 teaches forming elements on the surface of a multilayer capacitor to be mounted on a circuit board.

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Any inquiry concerning this communication or earlier communications from the examiner should be directed to Justin P. Bettendorf whose telephone number is (703) 308-2780. The examiner can normally be reached on 6:00-3:30 (M-F, 1st Friday off).

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Robert J. Pascal can be reached on (703) 308-4909. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 308-7722 for regular communications and (703) 308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0956.



Justin P. Bettendorf  
Primary Examiner  
Art Unit 2817

jpb  
March 5, 2003